ELECTRICAL LOAD
AND POWER SOURCE CAPACITY REPORT
FOR THE C-130 AIRCRAFT
MICROWAVE LANDING SYSTEM (MLS)

SLIASC MODEL 6216

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1.0 SCOPE - This report presents the electrical load analysis for the installation of the Microwave Landing System (MLS) Class V Modification into the C-130 aircraft. It contains the load requirements of the MLS receivers and the MLS relay panel, and the effects of these components on the C-130 bus loads.

2.0 APPLICABLE DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

SPECIFICATIONS:

Military

MIL-E-7016F	Electric Load and Power Source Capacity, Aircraft, Analysis of

OTHER PUBLICATIONS:

Technical Orders

T.O. 1C-130B-2-7	Technical Manual Maintenance Instructions Electrical Systems USAF Series C-130B, C-130E, C-130H Serial No. AF73-0158 through AF73-01598 USCG Series HC-130B aircraft
T.O. 1C-130E-2-7-1	Technical Manual Maintenance Instructions Electrical Systems USAF Series C-130E aircraft (AWADS)
T.O. 1C-130E-2-7-2	Technical Manual Maintenance Instructions Electrical Systems USAF Series C-130E, C-130H aircraft (AN/APN-169A)
TY.O. 1C-130H-2-7	Technical Manual Maintenance Instructions Electrical Systems USAF Series C-130H and LC-130H aircraft Serial No. AF74-01658 and up

3.0 POWER LOADING DATA

3.1 POWER LOADING DATA FOR THE MICROWAVE LANDING SYSTEM (MLS) - Electrical power loading data is given in table I for the equipment installed for the Microwave Landing System Class V modification.

Table I. AC-DC Loading, Equipment Installed

PROJECT EQUIPMENT LIST (PRELIMINARY)		ELECTRICAL POWER REQUIREMENTS				
ITEM	DESCRIPTION	VOLTS	PROG	VA/AMP	PHASE	PF
1	MLS RECEIVERS	115 VAC	400	50	1Ø	1
2	MLS POWER ON RELAYS	28 VDC		0.11		
2	MLS SIGNAL RELAYS	28 VDC		0.081		

3.2 AC POWER LOADING FOR MLS EQUIPMENT - AC electrical power loading data is given in table II for the MLS Class V modification.

3.3 DC POWER LOADING FOR MLS EQUIPMENT - DC electrical power loading data is given in table III for the C-130B MLS Class V modification. DC electrical power loading data for all other aircraft is given in table IV for the MLS Class V modification.

4.0 SUMMARY AND CONCLUSION

4.1 SUMMARY

4.1.1 AC ELECTRICAL POWER - The MLS receivers will obtain AC electrical power from the pilot's upper circuit breaker panel, Right Hand AC Bus.

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Table II. Installed MLS Equipment (ALL Aircraft) AC Load

SOURCE OF POWER						NO. OF UNITS	VOLT-AMP PER UNIT 200 V		PWR FAC-TOR	LOADING AND ANCHOR	STARTUP AND WARMUP	TAXI	TAKEOFF AND CLIMB	CRUISE	EMERG-ENCY	LANDING
EQUIPMENT	LH AC BUS	ESS AC BUS	MAIN AC BUS	RH AC BUS	SEC AC BUS		3Ø	1Ø								
MLS RECEIVER NO. 1				√		1		50.0	1	50.0	50.0	50.0	50.0	50.0		50.0
MLS RECEIVER NO. 2				√		1		50.0	1	50.0	50.0	50.0	50.0	50.0		50.0
TOTAL				√				100.0		100.0	100.0	100.0	100.0	100.0		100.0

Table III. Installed MLS Equipment (C-130B) DC Load

SOURCE OF POWER				NO. OF UNITS	AMPS	LOADING AND ANCHOR	STARTUP AND WARMUP	TAXI	TAKEOFF AND CLIMB	CRUISE	EMERG-ENCY	LANDING
EQUIPMENT	ESS DC BUS	ISO AND BAT BUS	MAIN DC BUS									
MLS POWER ON RELAYS	√			2	0.11	0.22	0.22	0.22	0.22	0.22		0.22
MLS SIGNAL RELAYS	√			4	0.081				0.16	0.16		0.16
TOTAL ADDED LOADS	√					0.22	0.22	0.22	0.38	0.38		0.38

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Table IV. Installed MLS Equipment (ALL Aircraft) DC Load

SOURCE OF POWER				NO. OF UNITS	AMPS	LOADING AND ANCHOR	STARTUP AND WARMUP	TAXI	TAKEOFF AND CLIMB	CRUISE	EMERG-ENCY	LANDING
EQUIPMENT	ESS DC BUS	ISO AND BAT BUS	MAIN DC BUS									
MLS POWER ON RELAYS	1/			2	0.11	0.22	0.22	0.22	0.22	0.22		0.22
PILOT'S	2/			10	0.081				0.57	0.57		0.57
MLS SIGNAL	3/			8	0.081				0.40	0.40		0.40
RELAYS			4/	8	0.081				0.40	0.40		0.40
COPILOT'S	2/			10	0.081				0.57	0.57		0.57
MLS SIGNAL	3/			8	0.081				0.40	0.40		0.40
RELAYS			4/	8	0.081				0.40	0.40		0.40
TOTAL	2/					0.22	0.22	0.22	1.36	1.36		1.36
ADDED	3/					0.22	0.22	0.22	1.02	1.02		1.02
LOADS	4/					0.22	0.22	0.22	0.22	0.22		0.22
			4/						0.80	0.80		0.80

NOTES:

1/ All Aircraft

2/ C-130H AF78-00806 through AF82-00061

3/ C-130E, HC-130H/N/P, WC-130E/H, C-130H AF62-1784 through AF74-02134

4/ C-130E and WC-130E AF61-2358 through AF61-2373

4.1.2 DC ELECTRICAL POWER - For all aircraft the MLS power on relays will receive DC electrical power from the pilot's upper circuit breaker panel, Essential DC Bus. For the C-130B aircraft the MLS signal relays will receive DC electrical power from the copilot's upper circuit breaker panel, Essential DC Bus. For the C-130E and WC-130E (AF61-2358 through AF61-2373) aircraft the MLS signal relays will receive DC electrical power from the copilot's upper circuit breaker panel, Main DC Bus. For all other aircraft the MLS signal relays will receive DC electrical power from the pilot's upper circuit breaker panel, Essential DC Bus.

4.2 CONCLUSIONS

4.2.1 AC LOAD - The MLS will increase the Right Hand AC bus load by 100 VA. The worse case increase for the Right Hand AC bus power is represented by the C-130B aircraft, with an increase in the bus load of approximately 0.33%, and with the bus operating at 76.4% capacity.

4.2.2 DC LOAD - The MLS worse case increase for the Essential DC bus power is represented by the C-130H (late) aircraft, which increases the bus load by 1.36 amps at 28 VDC. The C-130B aircraft represents the lowest increase in Essential DC bus load of 0.38 amps at 28 VDC. The C-130E and WC-130E (AF61-2358 through AF61-2373) aircraft differs in that it increases the Main DC bus load by 0.8 amps at 28 VDC, and increases the Essential DC bus load by 0.22 amps at 28 VDC. All other aircraft have an increase of Essential bus load of 1.02 amps at 28 VDC. The WC-130H aircraft has the worse case Essential DC bus operating capacity at 66.3%. This represents an overall increase of 0.52% in bus loading.